

Claim Rejections – 35 USC §102 or 35 USC §103

Claims 1-21 stand rejected under 35 USC §102(b) or 35 USC §103(a) as being anticipated by or obvious over Hurley et al. (US 5,938,878).

Hurley discloses foam laminate structures having a core of relatively high density material and one or more layers of relatively low density polymer foam covering the core (col. 1, lines 47-52). The foam layers may include various polymers such as LDPE, HDPE, LLDPE, EPDM, PVC, EVA, EEA, EPR, etc., to name but a few in the list of polymers set forth at col. 9, lines 20-45.

At paragraph 6 of the Office Action, the core material of Hurley is stated to be analogous to the coating as claimed in the present application, and it is noted that the core of Hurley may comprise, *inter alia*, ethylene/vinyl acetate copolymer (col. 9, lines 20-45).

In response, Applicant points out that the core layer of Hurley is a structural component of the disclosed foam laminate structure (see, e.g., col. 7, line 46 through col. 8, line 11 and FIGS. 1-3). Accordingly, Applicant submits that Hurley does not teach or suggest using ethylene/vinyl acetate copolymer as a coating disposed on a foam sheet in order to bond such foam sheet to a second foam sheet having a different chemical composition and at a bond strength of at least 4 lb_f/inch as claimed.

In order to better define the nature of the claimed coating, i.e., a relatively thin, non-structural layer that functions only to bond two different foam layers, claims 1 and 12 have been amended to specify that the thickness of the coating ranges from about 1 to about 6 mils. Support for the amendment is found in the specification at page 7, lines 15-18. Applicant has found that a thin coating having a thickness ranging from about 1 to about 6 mils provides a stronger bond between

two polyolefin foam sheets having different chemical compositions than a similar coating having a greater thickness. For example, the bond strength between a polypropylene foam sheet and a polyethylene foam sheet was unexpectedly found to be far greater using a 4-mil coating of ethylene/vinyl acetate copolymer than a 10-mil coating. The bond strength resulting from the 4-mil coating in accordance with the invention was 4.417 lb_f/inch, while the bond strength resulting from the 10-mil coating was only 1.890 lb_f/inch. Thus, the 10-mil coating could not provide a bond strength adequate to meet the claimed minimum of at least about 4 lb_f/inch. This is significant because, for commercial applications, a bond strength of at least 4 lb_f/inch is required.

A coating in accordance with the invention of about 1-6 mils is neither taught nor suggested in Hurley, which discloses that the core has a thickness of between 1/8 and 3/8 inch (column 7, line 66). As noted in the Applicant's specification at page 7, line 16, "1 mil = 0.001 inch." Thus, the above-noted passage from Hurley teaches that the core has an equivalent thickness ranging from 125 to 375 mils, which is far thicker than the 1-6 mil thickness range of Applicant's coating, as now recited in claims 1 and 12.

Accordingly, Applicant respectfully points out that Hurley neither teaches nor suggests the claimed thickness range of the coating of the present invention, and therefore does not anticipate or establish a *prima facie* case of obviousness against claims 1-21.

Claims 1-6 and 9-15 stand rejected under 35 USC §102(b) or 35 USC §103(a) as being anticipated by or obvious over Speilau et al. (US 4,368,604).

Speilau discloses insulating panels 10 for roof coverings, comprising two laminated-together polyethylene foam sheets 2, 3 (col. 6,

lines 49-53). The two foam sheets are diagonally offset to provide staggered rabbets 9a and 9b (sentence bridging cols. 6-7). The staggered rabbet 9a is provided with a “bilaterally adhesive strip 5 formed of couthouc or EPDM” (col. 7, lines 3-5). A vertical butt joint 6b between adjacent panels is “closed force-lockingly by injecting an adhesive or a hot-melt adhesive, e.g. couthouc modified bitumen, EPCM-adhesive, chloroprene couthouc adhesives or as hot melts, e.g. ethylene vinyl acetate or polyamide hot melts” (Col. 7, lines 17-23.)

Paragraph 7 of the Office Action notes that Spielau discloses “a sealing surface layer 5 between the two foam sheets (figure 1).” To the extent that this passage refers to the “bilaterally adhesive strip 5” referenced above, Applicant agrees. However, Spielau teaches that the strip 5 is formed of “couthouc or EPDM” (col. 7, lines 3-5). In contrast, independent claims 1 and 12 have now been amended to specify that the claimed coating comprises “ethylene/vinyl acetate copolymer.” This feature is neither taught nor suggested by Spielau’s disclosure of couthouc or EPDM as the bilaterally adhesive strip 5. Although ethylene/vinyl acetate is mentioned column 7, line 22 of Spielau, this is in reference to a type of hot melt that may be used to inject into the vertical butt joint 6b (col. 7, lines 17-23), and is unrelated to the adhesive strip 5.

Furthermore, as noted above, claims 1 and 12 have been amended to specify that the thickness of the coating ranges from about 1 to about 6 mils. Such thickness range, which is not taught or suggested in Spielau, results in a coating that is capable of bonding together two foam sheets having different chemical compositions at a bond strength of at least 4 lb_f/inch as claimed. In contrast, Spielau’s laminated foam sheets are both polyethylene, i.e., of the same composition (col. 6, lines 49-53). Thus, Spielau fails to meet this claim element as well.

Accordingly, Applicant respectfully submits that the invention as presently claimed is patentably distinct from Spielau.

Finally, Applicant will respond briefly to the two case-law citations set forth in the Office Action. *In re Hutchison*, 69 USPQ 138 (CCPA 1946), is cited at paragraphs 6 and 7 of the Office Action to support the proposition that the phrase “capable of” performing a function is not a positive limitation and, thus, does not constitute a limitation in any patentable sense. In response, Applicant notes that, although the phrase “capable of” appeared in the claims at issue in *In re Hutchison*, the court did not hold that such phrase was not a limitation in a patentable sense as alleged in the Office Action. In fact, the court did not criticize or even substantively comment on the use of such phrase at all.

The main thrust of the holding in *In re Hutchison* was that each of the claims “contain[ed] functional statements which may not be regarded as limiting the claims, they being article claims.” *Id* at 141. However, this case was decided in 1946, prior to the 1952 Patent Act. It is now well established that functional language is perfectly acceptable in claims, including article claims. For example, MPEP §2173.05(g) provides that “[f]unctional language does not, in and of itself, render a claim improper.” In fact, §2173.05(g) of the MPEP specifically indicates that the negative form of “capable of” is “perfectly acceptable [claim language] because it set[s] definite boundaries on the patent protection sought.” Accordingly, *In re Hutchison* is clearly irrelevant in view of current patent jurisprudence, which plainly indicates that Applicant’s claim phrase “said coating is capable of bonding said polyolefin foam sheet to a second foam sheet … at a bond strength of at least about 4 lb_f/inch” is appropriate functional language that carries as much patentable weight as the other elements of Applicant’s claims.

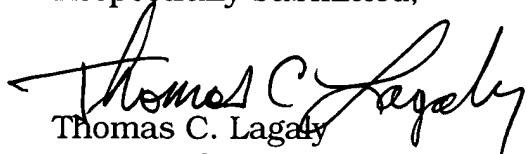
At paragraphs 6 and 8 of the Office Action, *In re Aller*, 105 USPQ 233 (CCPA 1955), is cited for the proposition that the discovery of optimum or workable ranges involves only routine skill in the art where the general conditions of a claim are disclosed in the prior art. In the instant case, however, the general conditions of the claims are not disclosed in the cited prior art. While Hurley teaches that EVA may be used in the core, this reference does not disclose or suggest a core thickness range that encompasses or overlaps the claimed 1-6 mil thickness range of the coating of the present invention. As noted above, Hurley instead discloses a much greater core layer thickness, ranging from 1/8 to 3/8 inch (col. 7, line 66), which equates to a thickness of 125 to 375 mils. Thus, Applicant has not merely discovered an optimum or workable range within the teaching of Hurley; instead, Applicant has discovered a range that is completely outside the teaching of Hurley. The claimed thickness range is also outside the teaching of Speilau, which does not teach a coating or layer of ethylene/vinyl acetate as claimed, but only the use of EVA as an adhesive to be injected into a vertical butt joint where the ends of two foams meet. *In re Aller*, therefore, is inapplicable.

Double Patenting

Claims 1-21 stand provisionally rejected under the doctrine of obviousness-type double patenting as being unpatentable over claims 1-21 of copending application serial no. 09/472,088. This rejection is now moot in view of the amendments to independent claims 1 and 12, which now specify that the coating comprises ethylene/vinyl acetate; none of claims 1-21 of serial no. 09/472,088 disclose ethylene/vinyl acetate.

For all of the foregoing reasons, Applicant submit that the claims as now presented are patentably distinct from the references of record and are, therefore, in condition for allowance. A Notice of Allowance is earnestly solicited.

Respectfully submitted,


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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the claims:

Claims 1 and 12 have been amended as follows:

1. (Amended) A composite structure, comprising:

a. a foam sheet comprising polyolefin; and

b. a coating disposed on at least one surface of said polyolefin foam sheet, said coating having a thickness ranging from about 1 to about 6 mils and comprising at least one member selected from ethylene/propylene rubber, homogeneous ethylene/alpha-olefin copolymer, ethylene/acrylic acid copolymer, ethylene/vinyl acetate copolymer, and blends of the foregoing,

whereby, said coating is capable of bonding said polyolefin foam sheet to a second foam sheet having a different chemical composition than said polyolefin foam sheet at a bond strength of at least about 4 lb_f/inch.

12. (Amended) A multilayer composite structure, comprising:

a. a first foam layer comprising polyethylene homopolymer or copolymer;

b. a second foam layer comprising polypropylene homopolymer or copolymer; and

c. a coating disposed between and bonding said first and second foam layers together at a bond strength of at least about 4 lb_f/inch, said coating having a thickness ranging from about 1 to about 6 mils and comprising at least one member selected from ethylene/propylene rubber, homogeneous ethylene/alpha-olefin copolymer, ethylene/acrylic acid copolymer, ethylene/vinyl acetate copolymer, and blends of the foregoing.

Claims 22-32 have been cancelled.